

What is claimed is:

1. An exhaust gas recirculation apparatus for an internal combustion engine mounted with a turbocharger in which a turbine is disposed in an exhaust passage and a compressor is disposed in an intake passage, comprising:

a passage opening and closing device that opens or closes an exhaust gas recirculation passage communicating the exhaust passage on the upstream side of said turbine with the intake passage on the downstream side of said compressor;

a port opening and closing device that opens or closes a port formed on the intake passage on the downstream side of said compressor;

an operating condition detecting device that detects an engine operating condition; and

a control unit that incorporates a microcomputer therein,

wherein said control unit judges whether or not the exhaust gas is to be recirculated based on the engine operating condition detected by said operating condition detecting device, and when it is judged that the exhaust gas is to be recirculated, performs a control to open said exhaust gas recirculation passage by said passage opening and closing device and at the same time to open said port by said port opening and closing device.

2. An exhaust gas recirculation apparatus for an internal combustion engine according to claim 1,

wherein there is formed an intake air return passage that returns the intake air taken out of said port to the intake passage on the upstream side of said compressor.

3. An exhaust gas recirculation apparatus for an internal combustion engine according to claim 1,

wherein said control unit controls an opening angle of said port in multi-stepwise based on the engine operating condition detected by said operating condition detecting device.

4. An exhaust gas recirculation apparatus for an internal combustion engine according to claim 1,

wherein said port opening and closing device comprises at least one of a shutter, a butterfly valve and a poppet valve.

5. An exhaust gas recirculation method for an internal combustion engine mounted with a turbocharger in which a turbine is disposed in an exhaust passage and a compressor is disposed in an intake passage, comprising the steps of:

judging whether or not the exhaust gas is to be recirculated based on an engine operating condition;

opening an exhaust gas recirculation passage communicating the exhaust passage on the upstream side of said turbine with the intake passage on the downstream side of said compressor when it is judged at said judging step that the exhaust gas is to be recirculated; and

opening also a port formed on the intake passage on the downstream side of said compressor.

6. An exhaust gas recirculation method for an internal combustion engine according to claim 5,

wherein there is formed an intake air return passage that returns the intake air taken out of said port to the intake passage on the upstream side of said compressor.

7. An exhaust gas recirculation method for an internal combustion engine according to claim 5,

wherein an opening angle of said port is controlled in multi-stepwise based on the engine operating condition.

8. An exhaust gas recirculation method for an internal combustion engine according to claim 5,

wherein said port is opened or closed by a port opening and closing device comprising at least one of a shutter, a butterfly valve and a poppet valve.